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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,946	02/18/2004	Jen-Chieh Shih	N1085-00201	2297

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DUANE MORRIS LLP
IP DEPARTMENT (TSMC)
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103-4196

EXAMINER

RAYMOND, BRITTANY L

ART UNIT	PAPER NUMBER
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1756

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/780,946

Applicant(s)

SHIH ET AL.

Examiner

Brittany Raymond

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 9-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 17-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Invention I, Claims 1-8 and 17-23 in the reply filed on 1/18/2007 is acknowledged.
2. Claims 9-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected method, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/18/2007.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richter (U.S. Patent Application 2002/0160318).

Richter discloses a method for structuring a photoresist layer consisting of:
providing a substrate (Paragraph 0015), placing a photoresist layer, which contains a

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photobase generator and a photoacid generator, on top of the substrate (Paragraph 0015), exposing the photoresist layer to a first wavelength in order to activate the photobase (Paragraph 0039), and exposing the photoresist layer to a second wavelength in order to activate the photoacid (Paragraph 0040), resulting in neutralization between the acid and the base (Paragraph 0055), as recited in claim 1 of the present invention. As described above, the first photoresist dissolving agent generator is a photobase and the second is a photoacid, as recited in claim 3 of the present invention. It would have been obvious to one of ordinary skill in this art to have the photoacid as the first photoresist dissolving agent generator and the photobase as the second, as recited in claim 2 of the present invention, because both are embedded in the photoresist layer and each process produces the same final pattern. Richter states that to activate the photoacid generator, light having a wavelength between 150 and 300 nm is used (Paragraph 0030). Richter also states that to activate the photobase generator, light having a wavelength between 150 and 300 nm is used (Paragraph 0032). Since the ranges are the same, the first and second light sources could provide the same or different wavelengths during the two exposures, as recited in claims 4 and 5 of the present invention. Richter also discloses that there is a post exposure bake step after the two exposures (Paragraph 0055), as recited in claim 6 of the present invention. Finally, Richter states that after the exposures, the photoresist is treated with a solution, in order to dissolve and remove unexposed photoresist, and the exposed parts remain behind to serve as a protective mask for a structuring step (Paragraph 0058), as recited in claims 7 and 8 of the present invention.

Richter fails to disclose that a first and second mask are used during the two exposure steps.

Richter states that a lithography mask is used to transfer a pattern onto the photoresist layer (Paragraph 0014).

It would have been obvious to one of ordinary skill in this art, at the time of invention by applicant, that more than one mask could be used during the exposure process because two different exposures are taking place.

5. Claims 17-23 are rejected under 35 U.S.C. 103(a) as being obvious over Richter (U.S. Patent Application 2002/0160318) in view of Ho (U.S. Patent Application 2004/0234897).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing

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that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

The teachings of Richter are discussed in paragraph 4 above.

Richter fails to disclose that a packing mask and unpacking mask are used in the two exposure steps, and that a water-soluble coating film is formed over the photoresist after the first exposure.

Ho discloses a process for exposing a water soluble photoresist comprising: providing a substrate with a first layer of photoresist deposited on top (Paragraph 0072), exposing the photoresist with a first packing mask (Paragraph 0073), applying a second layer of water soluble photoresist (Paragraph 0075), and exposing the water soluble photoresist through an unpacking mask to form holes in accordance with holes in the first pattern (Paragraph 0076), as recited in claims 17 and 21 of the present invention. Since the coating film over the photoresist is also a photoresist, it would be obvious to one of ordinary skill in this art that a photoresist dissolving agent generator of some type would be used in order to form openings in the layer during exposure, as recited in claim 20 of the present invention. As stated above, the coating film is a water soluble resist, as recited in claim 22 of the present invention. The recitations of claims 18, 19, and 23 have been discussed in regards to Richter in paragraph 4 above.

It would have been obvious to one of ordinary skill in this art, at the time of invention by applicant, to have used unpacking and packing masks and a water soluble

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film, as suggested by Ho, in the process of Richter because Ho teaches that the use of these allows for optimum pattern density of the created pattern.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brittany Raymond whose telephone number is 571-272-6545. The examiner can normally be reached on Monday through Friday, 8:00 a.m. - 4:30 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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KATHLEEN DUDA
PRIMARY EXAMINER